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**Final Report  
NASA Project # NAG-1-1438**

**DIAGNOSTIC MODELLING STUDIES OF THE  $H_xO_y$ -O<sub>3</sub> PHOTOCHEMICAL  
SYSTEM AND ITS COUPLING TO SULFUR, CARBON, AND HALOGENS BASED  
ON NASA GTE FIELD DATA**

**Submitted to:  
Mr. James Hoell, Jr.  
Mail Stop 483  
NASA Langley Research Center  
Hampton, VA. 23665-5225**

**From:  
Dr. Douglas D. Davis  
School of Earth and Atmospheric Science  
Georgia Institute of Technology  
Atlanta, GA. 30332**

For the time period of this grant 3/17/92 to 3/17/95 a total of 14 manuscripts based on the results from NASA's PEM-West(A) field program. This effort has involved both contributions to papers in which this PI was a co-author (i.e., 10 papers) as well as those in which his group took the lead role in writing the paper (e.g. 4 papers). As of the end of December 1996 all manuscripts listed below had been accepted for publication or had appeared in print as related to the special PEMWest(A) and PEM-B JGR special issues. Six additional manuscripts have either been submitted for publication or are now in preparation.

#### Co-authored Papers

- (1) Large-scaled Air Mass Characteristics Observed Over the Western Pacific during the Summertime. E. Browell-lead author.
- (2) Hydrogen Peroxide and Methylhydroperoxide Distributions Related to Ozone and Odd-Hydrogen Over the North Pacific in the Fall of 1991. B. Heikes-lead author.
- (3) The Pacific Exploratory Mission-West Phase A: September-October, 1991. Hoell-lead author.
- (4) Reactive Nitrogen Over the Pacific Ocean during PEM-West (A). Y. Kondo-lead author.
- (5) Atmospheric Sampling of Super-Typhoon Mireille with the NASA DC-8 Aircraft on Sept. 27, 1991 during PEM-West (A). R. Newell-lead author.

- (6) Low Ozone in the Marine Boundary Layer of the tropical Pacific Ocean: Photochemical Loss, Chlorine Atoms, and Entrainment. H. Singh-lead Author
- (7) Reactive Nitrogen and Ozone Over the Western Pacific: Distribution, Partitioning and Sources. H. Singh-lead author.
- (8) Tropospheric Western Pacific Air Mass Classification Schemes for the PEM-West (A) Experiment. S. Smyth-lead author.
- (9) Sulfur Dioxide as a Source of CN in the Upper Troposphere of the Pacific Ocean. D. Thornton-lead author.
- (10) Evidence of heterogeneous chemistry on sulfate aerosols in stratospheric air masses measured in PEM-West B. Kotamarthi lead author.

D. Davis (or group members) as lead author:

- (A) A Photostationary State Analysis of the  $\text{NO}_2$ -NO Systems Based on Airborne Observations from the Western and Central North Pacific.
- (B) An Assessment of Ozone Photochemistry in the western North Pacific as Inferred from PEM-West (A) Observations during the Fall 1991.
- (C) Potential Impact of Iodine on Tropospheric Levels of Ozone and other Critical Oxidants.
- (D) Implications of Large Scale Shifts in Tropospheric  $\text{NO}_x$  Levels in the Remote Tropical Pacific.